cal, and that their lying-in period spent in the institution is a happier one. Women instinctively feel in a hospital with a well-organized service that they are in competent hands. With modern methods of amelioration of the agony of labor pains, with the possibility of excluding unwelcome and annoying visitors during the first week of the puerperium, with the crying or fretful baby happily out of hearing, with the food uniformly good and well selected, with the electric breast pump and other modern devices to meet the unpleasant complications that arise, what woman would choose the home with its inconveniences, its annoyances and dangers?

Would it not be better to continue our efforts in behalf of better maternity services in our present hospitals and the construction and endowment of more maternity hospitals throughout the country. This should be a matter of concern to our women in public life. The needless sacrifice of twenty-five thousand of our splendid American women yearly still goes on. It is an indictment of our profession that may best be met by hospitalization of all maternity cases. It is inconceivable that midwives and those physicians who are responsible for the high mortality in obstetrical cases can ever by any means be educated, exhorted or forced to change their slovenly, death-inviting methods.

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Doctor Fist (closing)—A well-conducted hospital is undoubtedly the best place for confinement. However, since delivery in the home, which has points in its favor as well as against it, is the method available to the greater number, it merits our consideration. With an annual mortality of about twenty thousand mothers and two million babies, it is high time that we attempt to improve home obstetrics.

We should not abandon or neglect the delivery room, but we must take care of home confinements. It is much easier to neglect the patient in the home where greater attention should be given to care from the time of conception to the end of the puerperium. Operative correction of diagnostic mistakes is not nearly so easily performed in the home.

Proper service must include: instructions to patient, prenatal care throughout pregnancy, and for at least six weeks postpartum if normal.

Doctor Farrell has spoken of the low out-patient mortality of the Los Angeles Maternity Dispensary, and of the interns trained there, under the direction of Doctor McNeile and himself. In my opinion this type of instruction is invaluable and should be prerequisite to the practice of obstetrics. Education of those who deliver the great number of patients is absolutely necessary. The Department of Health of the state of New York made a step in the right direction by inaugurating lecture courses in obstetrics for physicians in rural districts. The improvement in technique and decrease in mortality which would follow such lectures in all states would be well worth the expense and effort.

Doctor Irwin has well brought out the fact that many deaths are due to hemorrhage during the third stage of labor. Proper conduct of the earlier stages of labor would greatly decrease the number of these.

Careful prenatal supervision is indispensable. In the majority of cases rectal and abdominal palpation suffice to furnish all necessary information as to progress. Avoidance of invasion of the birth canal is fundamental. Heart sounds of mother and baby must be watched at frequent intervals. Proper scrubbing of hands and use of sterile linen, now so easily obtainable, eliminate much danger. Active supervision of the second stage should always be the rule. These things are all possible, but education of those engaged in home obstetrics must precede general improvement in that work.

Without decrying efficient hospital service for abnormal childbirths, a plea is again entered for more efficient care of normal births in the home.

TERATOMA OF THE TESTICLE—DIAGNOSIS AND TREATMENT

By Edward J. Kilfoy, M. D.
Los Angeles

Discussion *by Foster K. Collins, M. D., Los Angeles; Frank Hinman, M. D., San Francisco; A. A. Kutzmann, M. D., Los Angeles.*

WHEN a patient presents himself with enlargement of the testicle the clinician or surgeon is confronted with a difficult problem and must consider that its diagnosis entails as much study as a cross-word puzzle.

The clinical diagnosis of teratoma of the testicle is difficult, as the physical findings are almost identical with those of other testicular tumors. The clinical diagnosis is usually determined after exclusion of the following different conditions: carcinoma, sarcoma, hydrocele, gumma, tuberculosis, hematoma, spermatocele, acute epididymitis, varicocele, bubo, and torsion of the spermatic cord. The most frequent conditions that have to be eliminated are lues, hydrocele, and tuberculosis. Gumma of the testicle resembles a tumor more closely than any of the other conditions. One must not forget that generalized lues and malignancy of the testicle may be coexisting in the same individual. A positive blood reaction is no excuse for prolonged delay for antiluetic treatment, as it is the lesser of the two evils to remove the gumma surgically than to delay operation on a highly malignant testicular tumor for antiluetic treatments.

Some cases of hydrocele and hematocele present difficulties of differentiation by clinical means. In a hematocele the transillumination of light often fails, also the feeling of fluctuation on palpation. There are certain cases of teratoma that contain cartilage or mucoid material which may transilluminate light and give fluctuation on pressure and these must be ruled out. Hydrocele may be present and completely mask the presence of the teratoma, as it did in one case in this series. When the size of the hydrocele masks the diagnosis, aspiration of the hydrocele should be done, followed by palpation of any tumor, if present.

Tuberculosis rarely presents much difficulty in diagnosis, as it is usually coincident in some other part of the body. The only type of case that might present some difficulty would be a case of tuberculo-epididymo-orchitis, a very rare condition.

The symptoms are of a local and general character. The patient usually presents himself for examination complaining of a swollen testicle, a hernia, or fluid in the testicle. Several patients complained of backache, and they were innocent of any coexisting testicular enlargement. In the medical cases the patients complained of an abdominal growth and did not know there was either a tumor of the testicle or an undescended testicle on the side involved. The general symptoms are those of any active organic disease, such as weakness, malaise, loss of weight and strength, loss

* Read before the Southern California Medical Association, March 18, 1927.

(The clinical case records for this paper came from the files of the Mayo Clinic, Rochester, Minnesota.)

of appetite, constipation, headache, and a mild secondary anemia.

On physical examination the teratoma may vary in size from a normal testicle to that of a large grapefruit. The teratoma usually retains the shape of the normal testicle. Occasionally there are areas that are irregular in outline and fluctuate on pressure. These areas are areas of degeneration within the teratoma itself. Teratoma are usually hard, smooth and tender on light pressure; the overlying skin is never involved and is freely movable over the teratomatous mass.

The potential high degree of malignancy, and the simplicity of an exploratory examination under local or gas anesthesia demand that each and every case of testicular enlargement should be so examined under anesthesia and tissue submitted for microscopic study to a competent pathologist. Further procedure will then be carried out according to the nature of the tumor. If examination is made in this way, an accurate diagnosis and prognosis of all testicular tumors can be made. Not until this is a routine procedure will a correct diagnosis be made in many testicular tumors.

Prognosis of the clinical course of teratoma depends upon a correct diagnosis of every testicular enlargement. If the tumor be strictly teratoma and the operation is done very early, followed by x-ray or radium and sometimes by both, the prognosis will be much more favorable.

METASTASIS OF TERATOMA OF THE TESTES

There are several courses in which teratoma of the testicle may metastasize. The most frequent of these are by the prevertebral system of lymph nodes. The primary lymph node involvements are the lumbar on the aorta for the left, and on the vena cava for the right, between the bifurcation of these vessels. The first work done as regards the lymph drainage of the testicle was performed by Most in 1899. Since then additional work has been done by Cuneo,[2] and Jamieson[5] and Dodson. Most, in his work, found no barrier between the testicle and the thoracic duct except the lumbar nodes which are imperfect, and the drainage goes directly to the subclavian vein. This is the route followed usually in general metastasis. The lumbar nodes are usually involved early, long before the tumor becomes any definite size. Figures 1 and 2 show the lumbar lymphatic nodes involved by secondary metastasis.

The second route of metastasis is through the accompanying veins of the ductus deferens, and this accounts for the pulmonary metastasis and metastasis of the liver, brain, and occasionally the kidneys.

The third place of metastasis is to the inguinal lymph nodes, and this usually occurs in those cases where there is a generalized lymph adenopathy, and where there are other findings of generalized metastasis. This always occurs late in the course of the duration of the teratoma.

The time necessary for metastasis to occur is very variable. Large metastases have been found in cases of short duration and vice versa. Autopsy and surgery have confirmed that teratoma spread

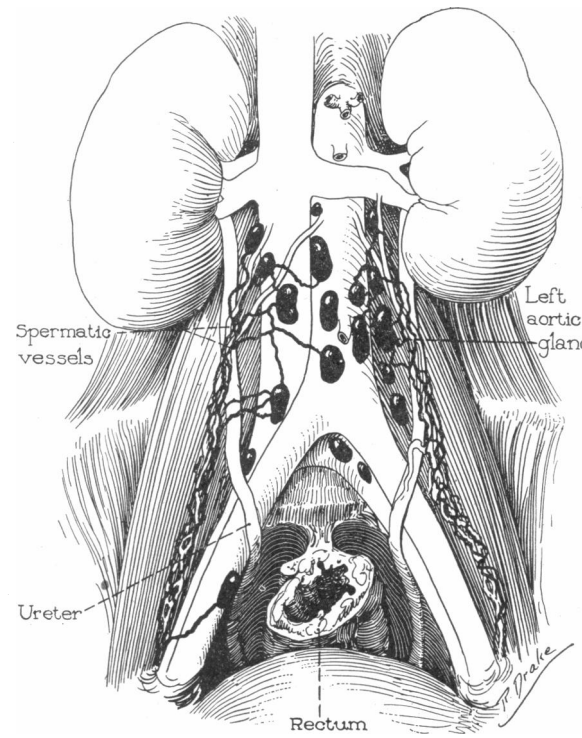

Figure 1—Shows the lumbar nodes involved by secondary metastasis.

more rapidly than unicellular tumors according to Chevassu. No doubt such lesions as teratoma and carcinoma have metastasized long before the primary growth is of a noticeable size. Therefore if surgical interference is to be done it should be employed as soon as possible. The size of the primary tumor has no ratio to the extent of the secondary metastasis. The secondary metastases are the lesions that always take life, as the vital organs are then involved.

On microscopic study, the secondary node may be identical with the primary, or may reproduce only one of several different features of the pri-

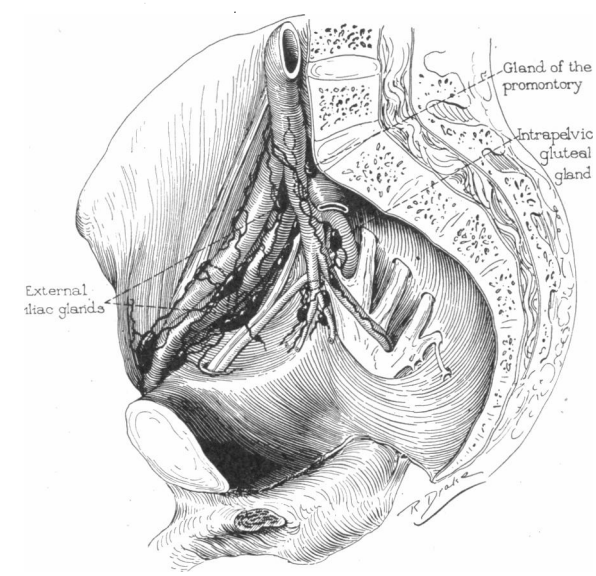

Figure 2—Shows the lateral view of the lower lumbar and sacral lymph nodes involved by secondary metastasis.

mary growth. The secondary nodes oftentimes may be as complex as the primary tumor itself. The secondary nodes in the mediastinum and cervical regions grow very rapidly and in a large percentage of the cases are the cause of death from mediastinal pressure on the heart and lungs causing cardiac and pulmonary embarrassment.

STUDY OF CASES

In this series of ten surgical cases of teratoma of the testicle, which were proven by microscopical study, the average age was found to be 29.5 years. The youngest patient was twenty-four and the oldest patient forty. Between ten and twenty there were no patients; twenty to thirty there were five patients; thirty to forty there were four patients. Between forty and fifty there was one patient. Beyond the fifth decade there were no patients. The average duration of symptoms was found to be 11.5 weeks. Of course the duration of symptoms cannot be exact, as many of the patients did not know the exact time the lesion began to grow.

Teratoma is always unilateral and occurs as frequently on one side of the testicle as the other. There was a history of injury in three cases. No doubt some of the others had had injuries, but of such slight nature that they did not mention it. Only one patient gave a definite history of neisserian infection. A positive blood Wassermann was not reported in a single case. The urine was negative and so was the blood count except for a mild secondary anemia in several of the advanced cases. All the patients except the first two, as reported in Table 1, had x-ray or radium or both.

There are five patients living and five patients dead. Of the patients living, the tumor was found by microscopic study to be teratoma; and in Case 3 the presence of carcinoma is questioned, as the patient is living and in good health. In Case 4, the pathological report showed adenocarcinoma of low-grade malignancy, and this was followed with x-ray and radium, and the patient was living on June 1, 1924. In the five patients that died, carcinoma was easily demonstrable, and they all died within a year after the time of the operation. Four of these patients had x-ray or radium, but the prognosis would have been the same no matter what procedure had been carried out. If carcinoma is coexisting in a teratoma the tumor is very highly malignant and the duration is short. If the tumor is a straight teratoma the prognosis is more hopeful, and the longevity may be indefinite as in Case 2, which patient is still living, eleven years after the operation. This shows that tissue from all testicular tumors in which secondary metastases are not demonstrable should be diagnosed by a competent pathologist. When carcinoma is coincident a more guarded prognosis can be made, and further x-ray or radium treatments can be carried out.

Table 2 represents a series of twelve medical cases; the exact diagnosis was not confirmed by the pathologist in this series of cases. Some of the cases were diagnosed as teratoma elsewhere. None of the patients in this group was operated upon. Seven of the patients had no known pathological diagnosis. In four of the patients the diagnosis was teratoma and in one the diagnosis was mixed tumor. There is no doubt that these patients also had areas of carcinoma, because at the time of examination large secondary metastases were found in the retroperitoneal, mediastinal, and cervical regions. Seven of the patients had had previous operations elsewhere and the other five had had no surgical procedure.

The average age was found to be 31.1 years,

TABLE 1—*Surgical Cases of Teratoma: Diagnosis Verified by the Pathologist*

Case	Age	Duration	Side	Injury or Metastasis	Operation	Pathologic Report	Treatment	Died	Living
1	26	6 weeks	Left	Injury at age of 11	Orchidectomy July 13, 1914	Teratoma and carcinoma	None	1-11-15	
2	30	4 months	Left	None	Orchidectomy and removal inguinal nodes March 7, 1913	Teratoma	None		March, 1924
3	24	9 weeks	Left	Injury, March, 1922	Castration and removal inguinal nodes May 8, 1922	Teratoma and carcinoma, cartilage, muscle, myxomatcus tissue	Many x-rays		6-22-24
4	32	3 months	Right	None	Castration October 23, 1922	Teratoma and adenocarcinoma	X-ray and radium		6-1-24
5	33	7 weeks	Left	None	Castration May 2, 1918	Teratoma and carcinoma	None	6-24-18	
6	23	4 weeks	Left	Injury at age of 12 and 18	Orchidectomy March 3, 1917	Teratoma with hair and cartilage	X-ray and radium		7-1-24
7	29	3 months	Right	None	Orchidectomy Dec. 24, 1917	Teratoma and carcinoma	X-ray	8-31-18	
8	40	8 months	Right	Palpable inguinal nodes	Orchidectomy and removal inguinal nodes April 7, 1925	Teratoma and highly malignant carcinoma	X-ray	7-1-24	
9	34	3 months	Right	None	Orchidectomy Nov. 11, 1921	Teratoma and carcinoma	X-ray		1-26-25
10	24	2 months	Right	None	Orchidectomy Oct. 15, 1924	Teratoma and carcinoma	X ray and radium	4-25-25	
Average 29.5		11.5 weeks	5 cases right; 5 cases left	3 with history of injury				5 dead	5 living

TABLE 2—*Medical Cases of Teratoma*

Case	Age	Chief Complaint	Duration	Injury or Infection	Treatment	Pathologic Diagnosis	Clinical Diagnosis	Result
1	40	Soreness in the abdomen	2 years	Injury to left testicle 2 years previously	Removal of testicle elsewhere 3 years previously		Teratoma of testicle, mediastinal metastasis	Died May 20, 1924
2	21	Tumor of left testicle	3 months	No injury or infection	Orchidectomy in 1921 elsewhere. X-ray and radium	Mixed tumor	Teratoma of testicle with retroperitoneal involvement	Died January, 1925
3	55	Mass in right suprapubic area	2 months	No injury. Gonorrhea	None		Teratoma of undescended testicle	Not known
4	33	Backache	3 months	Gonorrhea. No injury	Right orchidectomy in 1917, elsewhere		Teratoma of testicle; metastatic nodes in neck and lungs	Died January, 1924
5	30	Lump in right abdomen. Left testicle absent	1 year	None	Castration elsewhere; X-ray		Teratoma of undescended testicle	Living in January, 1925
6	21	Swelling in right testicle	2 months	None	None		Teratoma of right testicle	Not known
7	45	Pain in back	6 months	Injury to right testicle 2 years previously	None		Teratoma of right testicle with metastasis to mediastinum, lungs, retroperitoneum	Died May, 1921
8	29	Backache. Mass in lower right quadrant	5 months	None	None. X-ray advised		Teratoma of the testicle, metastasis to lungs and mediastinum	Died Dec., 1919
9	41	Enlargement of left testicle	7 months	None	Castration in 1916. Coley's fluid. X-ray elsewhere	Teratoma	Teratoma of left testicle, metastasis to lungs	Died March, 1919
10	37	Pain in right inguinal region	3 months	None	Right castration March, 1917	Teratoma	Teratoma, with large cervical nodes, metastasis to lungs	Not known
11	39	Tumor in region of right kidney	1 year	None	Laparotomy, Feb., 1917, elsewhere	Teratoma	Teratoma of undescended testicle	Not known
12	32	Backache	2 years	None	None	Teratoma	Metastasis to retroperitoneal nodes	Not known

and the age of incidence was as follows: between ten and twenty, no cases; twenty to thirty, three cases; thirty to forty, five cases; forty to fifty, three cases; and beyond the fifth decade there was one case. Only two of the patients gave a history of injury and one gave a history of Neisserian infection. One patient had a diagnosis of a mixed tumor. Teratoma was diagnosed in four patients, and in seven the exact diagnosis was not known. Of this group, six of the patients are dead, and in five others it was not possible to obtain any data. There is one patient living in which a castration was done elsewhere, followed by many x-ray treatments. At the time of physical examination eight of the patients had demonstrable secondary metastases to the retroperitoneal, mediastinal, and cervical regions. The other four patients had diagnoses of teratoma in undescended testicle.

TREATMENT

The treatment in cases of teratoma is a problem that confronts one after the diagnosis is made. The size of the primary lesion is no indication of secondary retroperitoneal metastasis, and this must always be kept in mind. Oftentimes they are present and there is no demonstrable way to show that they are present. The operation as followed in this series of cases was castration, removal of the vas, and neighboring inguinal lymph nodes. The more radical operations as described by Hinman,[3,4] may be carried out with success with a fairly low surgical mortality. The advantage of the radical operation is that the lymph nodes that are primarily involved are removed.

In this series a simple operation was performed with no surgical mortality and the operation was followed by x-ray or radium and sometimes both, with fairly satisfactory results in cases in which carcinoma was found not to exist or of a low-grade malignancy if present. Some authors state that simple castration will cure from 10 to 20 per cent. Others state that simple castration is as good as "no operation at all." The surgical operation will depend upon the type of tumor and the grade of carcinoma if present. If high-grade carcinoma be present the prognosis is the same whatever operative procedure is carried out.

The x-ray and radium therapy are very valuable adjuncts in the treatment of this type of tumor, but are far from being curative, as reported by Barringer [1] and Dean after four years' follow-up treatments and repeated examinations. Some authors advise x-ray preoperatively, but this has not been tried in this series of cases. If the tumor is so large that it requires preoperative x-ray there is no need of surgical intervention. It has long been a known fact that the more embryonic in type the better the tumor responds to x-ray therapy. If this holds true, then in cases of true teratoma the x-ray is of great value, and is indicated in heavy and repeated doses, especially during the first year after the operation. After the first year all patients with or without metas-

tasis should receive some x-ray therapy as an additional safeguard.

Regardless of how careful one may be and of the surgical procedure employed, the prognosis must always be guarded and the patient kept under observation from time to time. If carcinoma is demonstrated by the pathologist the patient must be closely watched for mediastinal and cervical metastasis. This requires repeated check-up examinations and x-ray pictures of the thorax. Not until this is carried out will the patient be given the chance to which he is entitled to carry on against the disease.

CONCLUSIONS

1. Teratoma may occur at any age, but they are most likely to occur between the second and third decades, which is the age of sexual prime. The average was found to be twenty-nine and five-tenths years.

2. Teratoma of the testicle is potentially malignant to a high degree, and the size of the primary tumor is no criterion as regards the duration of the lesion, or the size of the secondary metastasis. If carcinoma is coexisting in a teratoma the prognosis is extremely bad. If the lesion is strictly teratoma the prognosis is much more favorable.

3. Because of the difficulty in making a correct clinical diagnosis, every questionable testicular tumor should be submitted to surgery and the tissue examined by a competent pathologist in order to make a correct diagnosis and a guarded prognosis.

4. Teratoma are much more frequent than stated in the literature, if the slide and gross specimen are thoroughly studied. The relative amount of blastodermic tissue varies greatly in different specimens.

5. The surgical treatment should consist at least of castration, including the vas and inguinal lymph nodes. The radical operation should be left to the choice of the surgeon. The surgical procedure should be followed up with x-ray or radium and sometimes both. X-ray and radium are very valuable adjuncts in the postoperative treatment.

6. After the patient has been dismissed he should be instructed as to what to look for, and to report every three months for the first year for a check-up examination. After this he should report every six months for the following five years for a check-up examination for metastases and x-ray therapy if indicated.

709 Medical Office Building.

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DISCUSSION

FOSTER K. COLLINS, M. D. (412 West Sixth Street, Los Angeles)—This paper by Doctor Kilfoy is a distinct contribution to the literature on the subject of teratoma of the testicle.

About 1911 Ewing gave his well-known contribution on this subject. At that time he claimed that, after excluding gumma, tuberculosis, and hematoma, practically all true tumors of the testicle were malignant and, including carcinoma, had not been shown to exist apart from teratomatous origin.

Young, in the year 1926, stated that Ewing might be correct.

It is thought that all normal testes contain "sex cells" in the reta testes that are the potential cells of the origin of teratoma. These usually suppressed cells are ready to express themselves in teratomatous changes after they are stirred up by some infection or irritating process.

The practical thing, from the viewpoint of general surgery, is to remember that the early malignant teratoma, so far as the testicle is concerned, is confined within the tunica albuginea, and, because the tumor is therefore smooth and lacks irregular, hard characteristics, may be easily overlooked in its early stages.

Early metastasis is by the lymph nodes along the cord, pelvic and abdominal vessels. These nodes may be of large size, fairly early, while the testicle still shows none other than a smooth tumor confined within the tunica albuginea. To await testicular manifestations outside the tunica albuginea is to lose control of the situation.

As Doctor Kilfoy has said, the high degree of malignancy in testicular tumors is such that every case should be explored and the tissue submitted for microscopical study. Radical removal in positive cases, followed by radiation, is the proper course.

Because a hydrocele may coexist with teratoma it is a very practical point that in the treatment of all hydrocele the testicle should be carefully examined for tumor, otherwise since local enlargement is frequently the only early symptom, the patient may lose the only chance he has to recover from a malignancy.

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A. A. KUTZMANN, M. D. (1052 West Sixth Street, Los Angeles)—This excellent presentation by Doctor Kilfoy is timely since the diagnosis and treatment of testicular tumors, especially the latter, have always presented many problems. Our present knowledge of diagnosis, clinical course, prognosis and treatment of testicular tumors emphasizes that nearly all are malignant and that an accurate and early diagnosis is essential.

An analysis of the present theories concerning the pathology shows that there are but two types of testicular tumors, both of which are malignant—the teratoma or mixed tumor, and the seminoma or unicellular type of tumor. This could be further simplified if we accept Ewing's theory, that all tumors are of teratomatous origin, and that a unicellular tumor such as the seminoma be considered as an overdevelopment of one tissue in a tumor tridermal in constitution. Recently in conjunction with Doctors Hinman and Gibson additional evidence was offered to Ewing's theory when we were able to find in a single specimen, mixed tissues of various types growing abundantly with the typical seminomatous tissue. Pathologically the differences of these two types of growths can be seen in the gross and microscopic studies. The seminoma presents

grossly a uniform, solid picture and microscopically a solid medullary growth in which other types of tissue are rarely found. Other teratoma present grossly a characteristically complex cystic picture and histologically an equally complex picture in which can be seen various types of carcinomatous proliferation, cystic spaces lined by different types of epithelium, islands of squamous cells, cartilage, etc., all supported upon a more or less abundant connective tissue stroma.

The use of the phrases "carcinoma coexisting in teratoma," "adenocarcinoma," etc., by the author is apt to be confusing. It is well to remember that the teratoma is a tumor of tridermal origin; that in general the malignant elements in such mixed tumors of the testicle (teratoma) are almost uniformly epithelial in type and therefore carcinomatous in nature; that these carcinomatous elements in the teratoma are generally amenable to classification into one or more of three groups; (*a*) trophoblastic-chorio-epithelioma; (*b*) hypoblastic-adenomatous type; (*c*) epiblastic-solid alveoli of basal cell type and tumors of the neurocytoma group. Hence the term "teratoma testis" should be used inclusively and as such signify all these types of degeneration.

The treatment has resolved itself into three groups: (1) simple orchidectomy; (2) orchidectomy with a radical resection of the preaortic lymph nodes; (3) orchidectomy with radiation. Orchidectomy even with early diagnosis has been a failure, carrying with it an ultimate mortality of 85 per cent due to the metastatic processes of the disease. There is sufficient statistical evidence to prove the inadequacy of this procedure. Reports of 50 per cent cures, such as Handfield-Jones', are far too optimistic and do not represent the true statistics. Realization of the ineffectiveness of orchidectomy has stimulated surgeons to greater efforts and to bring forth the second and third methods of treatment. These are based upon a knowledge of the testicular lymph drainage which plays an important part in the metastasizing and rendering most treatment ineffective.

In a recent analysis of personal cases and cases from the literature, Hinman showed that the cures had been increased 100 per cent by means of the radical operation. Cases with metastases to the preaortic lymph glands were still living, some over four years with no sign of the disease, following radical removal. This operation is based on the principle that attack on a malignant tumor and its lymph drainage to be successful must be whole-hearted.

Radiotherapy as advocated by Barringer and Dean has produced some excellent results, especially in cases designated as "recurrent inoperable." This should not be surprising when it is recalled that the x-ray and radium have been found to exert a specific action on the spermatogenic cells, with no tendency to destroy other tissues. The slowly increasing number of case reports in the literature and the writer's experience have shown the seminoma type of testicular tumor to react the most favorably to this type of treatment. From observations, I believe that at present the most efficient treatment is the radical operation for the mixed type (teratoma) of tumor, with orchidectomy and deep therapy in the unicellular (seminoma) type.

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FRANK HINMAN, M. D. (384 Post Street, San Francisco)—Doctor Kilfoy has presented a very good outline of the diagnosis and treatment of tumors of the testicle. There is little to add in the way of discussion, particularly after having read Doctor Kutzmann's discussion inasmuch as my opinion conforms to his with respect to nomenclature and treatment particularly.

With respect to the routes of metastasis of malignant tumors of the testicle, it is quite apparent from what is said in the paper that the prevertebral lymph nodes are the primary and most important zones. As to the metastasis from inguinal lymph nodes, this does not occur unless the integuments covering the testicle are involved by invasion, which occurs only in very late stages of the disease. There is no object, therefore, in removing the neighboring inguinal lymph nodes at the time of an ordinary castration.

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DOCTOR KILFOY (closing)—I wish to thank Drs. Collins, Kutzmann, and Hinman for their timely discussions of this paper.

The classification of testicular tumors varies considerably according to the author, and is badly in need of a standard classification. The operation to be performed should be left to the judgment of the surgeon and the clinical findings of the patient. I doubt if all the lumbar and sacral lymph nodes are removed in doing the radical operation, and if they are not all removed the primary purpose of the operation is defeated.

INTERESTING FACTS ABOUT THE HEART*

WITH AN ANALYSIS OF CASES

By ARTHUR E. MARK, M. D.

Los Angeles

DISCUSSION *by Harry Spiro, M.D., San Francisco; James F. Churchill, M.D., San Diego; Donald Jackson Frick, M.D., Los Angeles.*

HEART disease has supplanted tuberculosis and cancer, and now leads in yearly fatalities. It is estimated that in this country 100,000 people die each year from organic heart disease.

Cohn [1] reports that approximately 2 per cent of the population of the United States are suffering from this affliction. These figures do not include the deaths from other diseases which frequently terminate in cardiac failure. For example, F. T. Billings [2] states that death in pneumonia is in the large majority of cases one of cardiac failure.

In practically all conditions which assume a critical state and especially in postoperative reactions, our greatest problem is to give adequate support to the heart.

CAUSATIVE FACTORS IN HEART DISEASE

The causes of heart disease are numerous and in many cases difficult to determine. Investigations into the various etiologic factors reveal many interesting facts and possibilities. Early in life rheumatic fever, tonsillitis, chorea, and other infectious diseases, are the principal factors causing carditis, while in later life arteriosclerosis, hypertension, nephritis, and syphilis, are the principle exciting causes.

In an analysis of 1001 cases of organic heart disease among adults, Wyckoff and Lingg [3] found that about one-fourth of the cases presented rheumatic heart disease; about two-fifths, arteriosclerotic; about one-tenth syphilitic; and about one-tenth, heart disease of unknown origin. Scarlet fever, hyperthyroidism, nephritis, etc., together contributed to less than one-tenth of the total. Many other interesting facts are given in their

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* Read before the Southern California Medical Society, November 6, 1926.